

WHAT IS CLAIMED IS:

1. A magnetic recording medium comprising, on a substrate, a multi-layer including a magnetic recording layer and a high-magnetostriction layer having magneto-  
5 striction larger than that of the magnetic recording layer.

2. A medium according to claim 1, wherein the magnetic recording layer is a perpendicular magnetic recording layer having perpendicular magnetic  
10 anisotropy.

3. A medium according to claim 2, further comprising a soft magnetic layer between the substrate and the multi-layer, wherein the multi-layer further includes, on a substrate side thereof, a low-elasticity  
15 layer having a Young's modulus lower than that of the soft magnetic layer.

4. A medium according to claim 1, wherein the high-magnetostriction layer has a magnetostriction constant larger than  $5 \times 10^{-5}$ .

20 5. A medium according to claim 1, wherein a saturation magnetic field of the high-magnetostriction layer is larger than that of the magnetic recording layer.

25 6. A medium according to claim 1, wherein the high-magnetostriction layer includes a combination of a high-magnetostriction film and a high-saturation-magnetic-field film having a saturation magnetic field

larger than that of the magnetic recording layer.

7. A medium according to claim 1, wherein the high-magnetostriction layer includes at least one member selected from the group consisting of  $RFe_2$  (R is a rare earth element),  $TbFe_2$ ,  $ErFe_2$ ,  $Sm_xDy_{1-x}Fe_2$ ,  $Tb_xDy_{1-x}Fe_2$ , an Fe/Pt stacked film, and a Co/Pd stacked film.

8. A medium according to claim 1, wherein the magnetic recording layer contains at least one of cobalt and iron, at least one of platinum and palladium, and at least one of chromium and oxygen.

9. A magnetic recording/reproducing apparatus comprising a recording medium which comprises, on a substrate, a multi-layer including a magnetic recording layer and a high-magnetostriction layer having magnetostriction larger than that of the magnetic recording layer, and a recording/reproducing head.

10. An apparatus according to claim 9, wherein the recording/reproducing head is a single pole recording head.

11. An apparatus according to claim 9, wherein the magnetic recording layer is a perpendicular magnetic recording layer having perpendicular magnetic anisotropy.

12. An apparatus according to claim 11, further comprising a soft magnetic layer between the substrate and the multi-layer, wherein the multi-layer further

includes, on a substrate side thereof, a low-elasticity layer having a Young's modulus lower than that of the soft magnetic layer.

13. An apparatus according to claim 9, wherein the  
5 high-magnetostriction layer has a magnetostriction constant larger than  $5 \times 10^{-5}$ .

14. An apparatus according to claim 9, wherein a  
saturation magnetic field of the high-magnetostriction  
layer is larger than that of the magnetic recording  
10 layer.

15. An apparatus according to claim 9, wherein the  
high-magnetostriction layer includes a combination of a  
high-magnetostriction film and a high-saturation-  
magnetic-field film having a saturation magnetic field  
15 larger than that of the magnetic recording layer.

16. An apparatus according to claim 9, wherein the  
high-magnetostriction layer includes at least one  
member selected from the group consisting of  $RFe_2$  (R is  
a rare earth element),  $TbFe_2$ ,  $ErFe_2$ ,  $Sm_xDy_{1-x}Fe_2$ ,  
20  $Tb_xDy_{1-x}Fe_2$ , an Fe/Pt stacked film, and a Co/Pd stacked  
film.

17. An apparatus according to claim 9, wherein the  
magnetic recording layer contains at least one of  
cobalt and iron, at least one of platinum and  
25 palladium, and at least one of chromium and oxygen.